Application of analytical pyrolysis in monitoring the reliability of vermicomposting residual biomass from hemiparasitic epiphyte *Tillandsia recurvata* (San Luis Potosí, México)

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Different species of *Tillandsia* (Bromeliaceae) are well-adapted to wet, warm forest formations in South America countries and in most Mexican States. In San Luis Potosí it represents a natural resource for local communities (animal feed, bulking agent in packaging, manufacture of ropes or cushions). More recently, some emerging research is focusing on the assessment of the potential of the biomass from this species in compost production. In this preliminary research two important features for the economical feasibility and final quality of compost are analyzed by analytical pyrolysis, i.e. the performance of the whole process by conventional composting or vermicomposting with *Eisenia foetida* (red earthworm) and the assessment of the optimum composting time determined from samples periodically collected from piles transformed up to 7 months.

Pyrolysis was carried out at 500 ºC in a Pyrojector (SGE instruments) connected to a GC/MS system Finnigan Trace GC Ultra with a Trace DSQ mass spectrometer. The chromatograph was provided with an HP-1 capillary column (30m × 250 μm), and the helium was adjusted to 1ml min^{-1}. The oven temperature was 50 ºC for 1 min, then increased up to 100 ºC at 30 ºC min^{-1}, from 100 to 300 ºC at 10 ºC min^{-1} and isothermal at 320 ºC.

The pyrolysis results showed that: i) *Tillandsia recurvata* is suitable material for compost production, their pyrograms showing a systematic, well defined methoxyphenolic pattern with dominance of vinylguaiacol, guaiacol and lower amounts of syringols. The presence of vinylphenol and other phenols suggested HGS-type lignin which is observed to be relatively resistant to selective biodegradation both in piles composted with or without the earthworm, ii) a series of diagnostic humification (maturity) indices for this material consisted of ratios between carbohydrate-derived (mainly alkylfurfurals and cyclic ketones) and aromatic compounds, which decreased with compost maturity reflecting selective preservation and concentration of altered lignins, iii) the changes in alkyl compounds were not a source of maturity indicators suitable to monitor compost quality or its degree of transformation (minor pyrolysis compounds) whereas changes in the syringyl/guaiacyl ratio could be used for the assessment of the transformation extent of the lignin.